M

[redacted]

M

Block

Add

1 unread message

Hello sir, Good afternoon apki youtube classess se aj ke exam me mujhe bhut benifit mila thank you sir

3:26 PM

आप लोगों के प्यार से GAMMA CAREER CLASSES ने एक नई क्रांति शुरू की है जिसमें Maths के हर टॉपिक को एकदम बेसिक लेवल से सिखाया जाएगा |

YOUTUBE https://youtube.com/@gammacareerclasses?si=dtTVpjcIZayzee4O

[redacted]

You mentioned @shekhar_bhatt84xx40 in your story

Today 3:52 PM

Good Afternoon Sir 😊
Asj ka paper Boht to nhi pr kafi acha aay tha ..

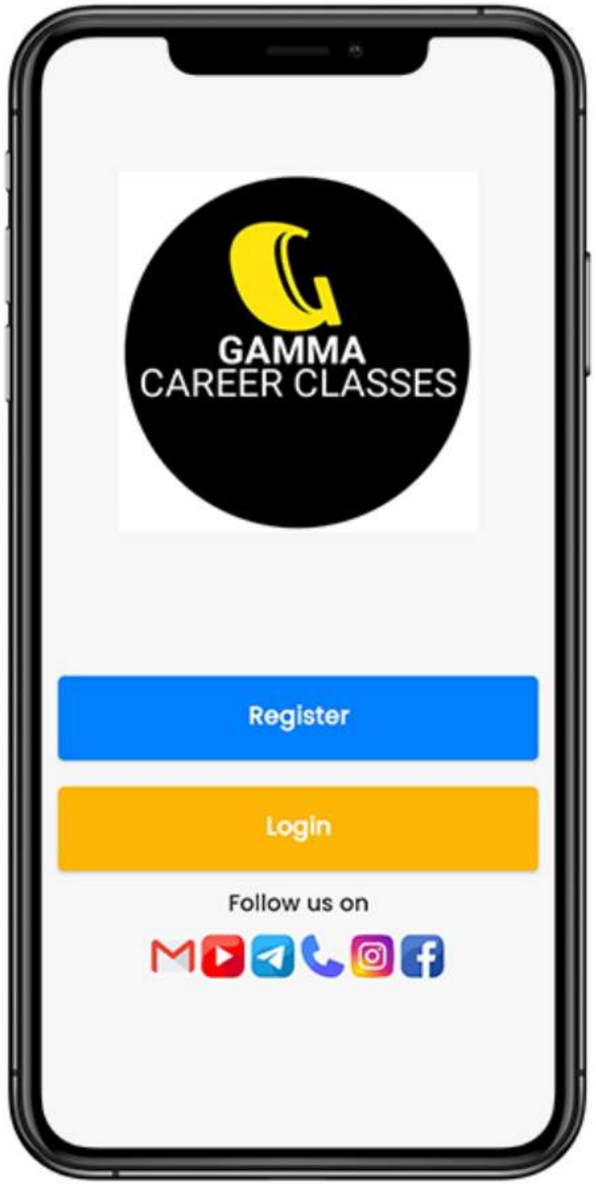
Mera set 1 aya tha aur ques bhi asan aaye the ..

Bs thode case study tough the baki sb shi tha .

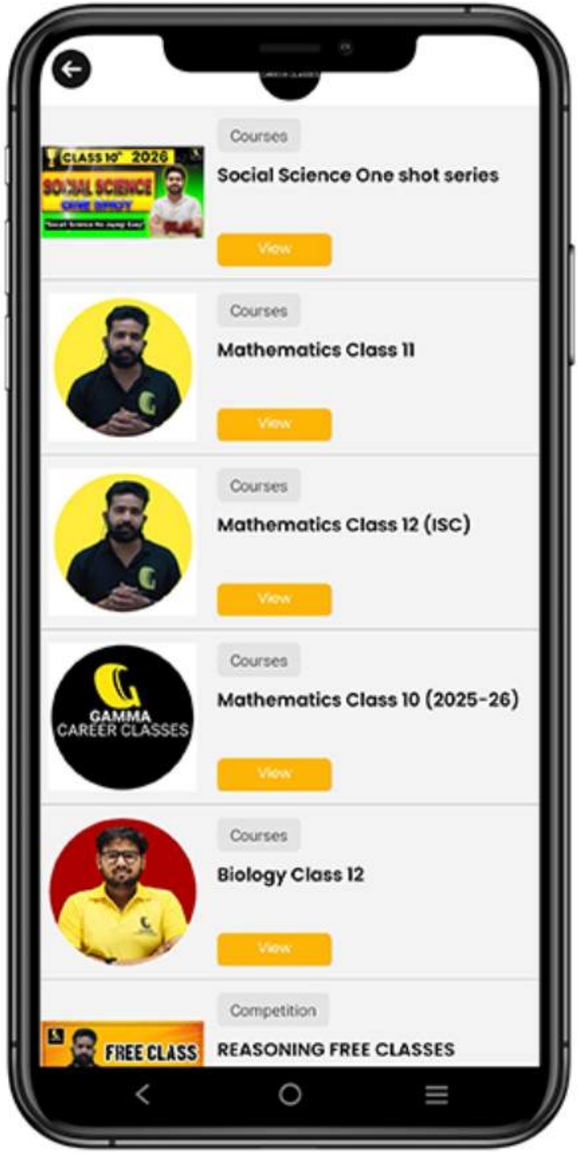
Thank u sir 😊 itni practice krwane ke liye 💖

Jitna shukriya bolu utna kam ha

Message...


GAMMA
CAREER CLASSES
Register
Login
Follow us on

Hello, Gamma Career Classes
MATHS FOUNDATION
CBSE | UP BOARD
CLASS 12
ONLY
₹ 799/-
Mock Test Free
8896818131
Academic
Competitio n
Test Series
Quick Links
Live Class
Free Courses
Previous Year Paper
Syllabus
Docs
Home
My Purchases
Downloads


Courses
Social Science One shot series
View
Courses
Mathematics Class 11
View
Courses
Mathematics Class 12 (ISC)
View
Courses
Mathematics Class 10 (2025-26)
View
Courses
Biology Class 12
View
Competition
REASONING FREE CLASSES

10th March

Differential Equation

$$\frac{dy}{dx} = y_1 = y'$$

$$\frac{d^2y}{dx^2} = y_2 = y''$$

$$\frac{d^3y}{dx^3} = y_3 = y'''$$

$$\frac{d^n y}{dx^n} = y^n = y_n$$

Equation (=)

$$x^2 + 3x + 2 = 0$$

$$x^2 + (x+1)x + 2 = 0$$

$$x^2 + 2x + x + 2 = 0$$

$$x(x+2) + 1(x+2) = 0$$

$$(x+2)(x+1) = 0$$

$$x = -2 \quad x = -1$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$3x + 2\frac{dy}{dx} = 0$$

Order → Highest order of derivative.

$$\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 2 = 0$$

Order = 2

Degree → power of highest order derivative.

$$\left(\frac{d^2y}{dx^2}\right)^1 + 2\frac{dy}{dx} + 2 = 0$$

Degree = 1

$$\frac{dy}{dx}\sin x + \frac{d^2y}{dx^2} = 0$$

Degree = 1

$$\sin\left(\frac{dy}{dx}\right) + \frac{d^2y}{dx^2} = 0$$

Degree → Not defin

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

The Degree of the differential equation

$$\frac{d^3y}{dx^3} + x^2\left(\frac{d^2y}{dx^2}\right)^3 = 0$$

Degree = 1

Order = 3

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\left(\frac{d^3y}{dx^3}\right)^3 + \frac{d^2y}{dx^2} + \sin\left(\frac{dy}{dx}\right) = 2x$$

Degree → Not define.

Order = 3

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\left(\frac{d^2y}{dx^2}\right)^3 + 2y\left(\frac{dy}{dx}\right) + siny = 5x^{2/3} + logx$$

Order = 2

Degree = 3

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2 + \sin\left(\frac{dy}{dx}\right) + 1 = 0$$

Order = 2

Degree = Not define.

DOWNLOAD GAMMA CAREER CLASSES AAP!

Solution of a Differential Equations

$$y = A\sin x + B\cos x$$

$$\frac{dy}{dx} = A\cos x + B(-\sin x) = A\cos x - B\sin x$$

$$\frac{d^2y}{dx^2} = -A\sin x - B\cos x$$

$$\frac{d^2y}{dx^2} = -(A\sin x + B\cos x)$$

$$\frac{d^2y}{dx^2} = -y \Rightarrow \boxed{\frac{d^2y}{dx^2} + y = 0}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{d^2y}{dx^2} + y = 0$$

$$y = A\sin x + B\cos x$$

A B (arbitrary order)

- General Solution (arbitrary Constant)
- Particular Solution. (No arbitrary Zero)

order of differential Equation.

K equal hogy.

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

Note:-

i) No of arbitrary constant equal to order of differential equation

ii) there is no arbitrary constant in particular solution.

DOWNLOAD GAMMA CAREER CLASSES AAP!

The number of arbitrary constant in the general solution of a differential equation of third order are

a) 0 b) 1 c) 2 d) 3

DOWNLOAD GAMMA CAREER CLASSES AAP!

The Number of arbitrary constant in the particular solution of a differential equation of fourth order.

A) 0 b) 1 c) 3 d) 4

DOWNLOAD GAMMA CAREER CLASSES AAP!

Verify that $y = ACosx - Bsinx$ is a solution of the differential Equation $\frac{d^2y}{dx^2} + y = 0$

$$y = A\cos x - B\sin x$$

$$\frac{dy}{dx} = A\frac{d}{dx}\cos x - B\frac{d}{dx}\sin x$$

$$\frac{dy}{dx} = -A\sin x - B\cos x$$

$$\frac{d^2y}{dx^2} = -A\cos x + B\sin x$$

$$\frac{d^2y}{dx^2} = -(A\cos x - B\sin x)$$

$$\frac{d^2y}{dx^2} = -y$$

$$\boxed{\frac{d^2y}{dx^2} + y = 0}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

Show that $y = ae^{2x} + be^{-x}$ is a solution of the differential equation:
$$\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 0$$

$$y = ae^{2x} + be^{-x}$$

$$\frac{dy}{dx} = a\frac{d}{dx}e^{2x} + b\frac{d}{dx}e^{-x}$$

$$\frac{dy}{dx} = 2ae^{2x} - be^{-x}$$

$$\frac{d^2y}{dx^2} = 2a\frac{d}{dx}e^{2x} - b\frac{d}{dx}e^{-x}$$

$$\frac{d^2y}{dx^2} = 4ae^{2x} + be^{-x}$$

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 0$$

$$= 4ae^{2x} + be^{-x} - (2ae^{2x} - be^{-x}) - 2(ae^{2x} + be^{-x})$$

$$= 4ae^{2x} + be^{-x} - 2ae^{2x} + be^{-x} - 2ae^{2x} - 2be^{-x} = 0$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

Verify that $y = x\sin 3x$ is a solution of the differential

$$\frac{d^2y}{dx^2} + 9y - 6\cos 3x = 0$$

$$y = x \sin 3x$$

$$\frac{dy}{dx} = \frac{d}{dx} x \sin 3x$$

$$\frac{dy}{dx} = x\frac{d}{dx}\sin 3x + \sin 3x \frac{d}{dx} x$$

$$\frac{dy}{dx} = 3x\cos 3x + \sin 3x$$

$$\frac{d^2y}{dx^2} = 3\frac{d}{dx} x\cos 3x + \frac{d}{dx}\sin 3x$$

$$\frac{d^2y}{dx^2} = 3\left[x\frac{d}{dx}\cos 3x + \cos 3x \frac{d}{dx} x\right] + 3\cos 3x$$

$$= 3\left[-3x\sin 3x + \cos 3x\right] + 3\cos 3x$$

$$= -9x\sin 3x + 3\cos 3x + 3\cos 3x$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{d^2y}{dx^2} + 9y - 6\cos 3x = 0$$

$$-9x\sin 3x + 6\cos 3x + 9(x\sin 3x) - 6\cos 3x$$

$$= 0$$

H.P

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

Method To Solve Differential Equations

i) Variable Separable method
ii) Homogenous differential Equations
iii) Linear Differential Equation

DOWNLOAD GAMMA CAREER CLASSES AAP!

Variable Separable method

$$\frac{dy}{dx} = \frac{y}{x}$$

$$\int \frac{dy}{y} = \int \frac{dx}{x}$$

$$\log|y| + c_1 = \log|x| + c_2$$

$$\log|y| - \log|x| = c$$

$$\log\left|\frac{y}{x}\right| = \log c$$

$$\frac{y}{x} = c$$

$$\boxed{y = xc}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{dy}{dx} = \sin^{-1} x$$

$$\int dy = \int \sin^{-1} x \, dx$$

$$y = \sin^{-1} x \int 1 \cdot dx - \int \left(\frac{d}{dx} \sin^{-1} x \int 1 \cdot dx \right) dx$$

$$= x \sin^{-1} x - \int \frac{1}{\sqrt{1-x^2}} \, x \, dx$$

$$y = x \sin^{-1} x - \int \frac{x}{\sqrt{1-x^2}} \, dx$$

Let $1 - x^2 = t$

$-2x \, dx = dt$

$$-x \, dx = \frac{dt}{2}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$y = x\sin^{-1}x - \int \frac{x}{\sqrt{1-x^2}}\,dx$$

$$= x\sin^{-1}x + \frac{1}{2}\int \frac{dt}{\sqrt{t}}$$

$$= x\sin^{-1}x + \frac{1}{2}\int (t)^{-1/2}\,dt$$

$$= x\sin^{-1}x + \frac{1}{2}\,\frac{t^{1/2}}{1/2}$$

$$= x\sin^{-1}x + \frac{1}{2}\times 2\sqrt{t}$$

$$\boxed{y = x\sin^{-1}x + \sqrt{1-x^2} + C}$$

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{dy}{dx} = (1+2x)(1+y^2)$$

$$\frac{dy}{dx} = (1+2x)(1+y^2)$$

$$\int \frac{dy}{(1+y^2)} = \int (1+2x)\,dx$$

$$\tan^{-1}y = x + \frac{2x^2}{2} + c$$

$$\boxed{\tan^{-1}y = x + x^2 + c}$$

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{dy}{dx} - \sqrt{\frac{1-y^2}{1-x^2}} = 0$$

$$\frac{dy}{dx} - \sqrt{\frac{1-y^2}{1-x^2}} = 0$$

$$\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$$

$$\frac{dy}{\sqrt{1-y^2}} = \frac{dx}{\sqrt{1-x^2}}$$

$$\sin^{-1}y = \sin^{-1}x + c$$

$$\boxed{\sin^{-1}y - \sin^{-1}x = c}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$sec^2x\ tanydx + sec^2y\ \text{tanxdy} = 0$

$$\sec^2 x \tan y\, dx + \sec^2 y \tan x\, dy = 0$$

$$\sec^2 y \tan x\, dy = -\sec^2 x \tan y\, dx$$

$$\int \frac{\sec^2 y\, dy}{\tan y} = -\int \frac{\sec^2 x}{\tan x}\, dx$$

$$\log|\tan y| = -\log|\tan x| + \log c$$

$$\log|\tan y| + \log|\tan x| = \log c$$

$$\log \tan x \tan y = \log c$$

$$\boxed{\tan x \tan y = c}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$(x+1)dy - 2xydx = 0$$

$$\log y = 2\left[x - \log(x+1)\right] + c$$

$$(x+1)dy = 2xy\,dx$$

$$\int \frac{dy}{y} = \int \frac{2x}{x+1}\,dx$$

$$\log y = 2\int \frac{x}{x+1}\,dx$$

$$= 2\int \left(1 - \frac{1}{x+1}\right)dx$$

$$\log y = 2x - 2\log(x+1) + c$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$(1+y^2)(1+logx)dx + xdy = 0$$

$$(1+y^2)(1+\log x)dx = -x\,dy$$

$$\frac{(1+\log x)dx}{x} = -\frac{1}{1+y^2}dy$$

$$\int \frac{1}{1+y^2}dy = \int -\frac{(1+\log x)dx}{x}$$

$$\tan^{-1}y = -\int \frac{1}{x}dx - \int \frac{\log x}{x} + c$$

$$\tan^{-1}y = -\log x - \frac{(\log x)^2}{2} + c$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{dy}{dx} = e^{x+y} + x^2 e^y$$

$$\frac{dy}{dx} = e^x \cdot e^y + x^2 e^y$$

$$\frac{dy}{dx} = e^y \left[e^x + x^2 \right]$$

$$\frac{dy}{e^y} = \left[e^x + x^2 \right] dx$$

$$\int e^{-y}\, dy = \int e^x\, dx + \int x^2\, dx$$

$$-e^{-y} = e^x + \frac{x^3}{3} + c$$

$$\boxed{\frac{-1}{e^y} = e^x + \frac{x^3}{3} + c}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$(e^y + 1)\cos x\, dx + e^y \sin x\, dy = 0$

$(e^y+1)\cos x\, dx + e^y \sin x\, dy = 0$

$(e^y+1)\cos x\, dx = -e^y \sin x\, dy$

$$\int \frac{e^y}{(e^y+1)}\, dy = -\int \frac{\cos x}{\sin x}\, dx$$

$$\log(e^y+1) = -\int \cot x\, dx$$

$$\log(e^y+1) = -\log \sin x + C$$

$$\log(e^y+1) + \log \sin x = \log c$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{dy}{dx} - e^{y+x} = e^{x-y}$$

$$\frac{dy}{dx} = e^{x-y} + e^{y+x}$$

$$\frac{dy}{dx} = e^{x}\left[e^{-y} + e^{y}\right]$$

$$\frac{dy}{e^{-y} + e^{y}} = e^{x}\,dx$$

$$\frac{dy}{\frac{1}{e^{y}} + e^{y}} = e^{x}\,dx$$

$$\int \frac{e^{y}}{1+(e^{y})^{2}}\,dy = \int e^{x}\,dx$$

Let $e^{y} = t$

$$e^{y}\,dy = dt$$

$$\boxed{\tan^{-1} e^{y} = e^{x} + c}$$

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

Find the Particular solution of the differential equations $x(1+y^2)dx - y(1+x^2)dy = 0$ given that y=1 when x=0

$$x(1+y^2)dx - y(1+x^2)dy = 0$$

$$x(1+y^2)dx = y(1+x^2)dy$$

$$\int \frac{y\,dy}{1+y^2} = \int \frac{x\,dx}{1+x^2}$$

$$\log(1+y^2) = \log(1+x^2) + \log c$$

$y=1$, $x=0$

$$\log 2 = \log 1 + \log c$$

$$\log 2 = 0 + \log c$$

$$c = 2$$

$$\log(1+y^2) = \log(1+x^2) + \log 2$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

Homogenous Differential Equations

Degree of every terms are Same.

1) $\boxed{\frac{dy}{dx} = \frac{y^2}{xy - x^2}}$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$\frac{dy}{dx} = \frac{y^2}{xy - x^2}$$

$y = vx$ → $\frac{y}{x}$

$$\frac{dy}{dx} = v + x\frac{dv}{dx}$$

$$v + x\frac{dv}{dx} = \frac{v^2x^2}{x^2v - x^2}$$

$$v + x\frac{dv}{dx} = \frac{x^2v^2}{x^2(v-1)}$$

$$v + x\frac{dv}{dx} = \frac{v^2}{v-1}$$

$$x\frac{dv}{dx} = \frac{v^2}{v-1} - v$$

$$x\frac{dv}{dx} = \frac{v^2 - v^2 + v}{v-1}$$

$$x\frac{dv}{dx} = \frac{v}{v-1}$$

$$\frac{v-1}{v}\,dv = \frac{dx}{x}$$

$$\int\left(1 - \frac{1}{v}\right)dv = \int\frac{1}{x}\,dx$$

$$v - \log v = \log x + c$$

$$\frac{y}{x} - \log\frac{y}{x} = \log x + c$$

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

$(x^2 + 3xy + y^2)dx - x^2 dy = 0$

$(x^2+3xy+y^2)dx - x^2dy = 0$

$y = vx$

$\frac{dy}{dx} = v + x\frac{dv}{dx}$

$-x^2dy = -(x^2+3xy+y^2)dx$

$+x^2\frac{dy}{dx} = +[x^2+3xy+y^2]$

$\frac{dy}{dx} = \frac{[x^2+3xy+y^2]}{x^2}$

$v + x\frac{dv}{dx} = \frac{[x^2+3x^2v+v^2x^2]}{x^2}$

$v + x\frac{dv}{dx} = \frac{x^2[1+3v+v^2]}{x^2}$

$v + x\frac{dv}{dx} = [1+3v+v^2]$

$x\frac{dv}{dx} = 1+3v+v^2-v$

DOWNLOAD GAMMA CAREER CLASSES AAP!

$$x\frac{dv}{dx} = v^2+2v+1$$

$$x\frac{dv}{dx} = v^2+2v+1$$

$$\frac{dv}{v^2+2v+1} = \frac{dx}{x}$$

$$\int\frac{dv}{(v+1)^2} = \int\frac{dx}{x}$$

$$\int(v+1)^{-2}dv = \log x + \log c$$

$$-(v+1)^{-1} = \log x + \log c$$

$$-\frac{1}{v+1} = \log x + \log c$$

$$\boxed{-\frac{1}{\frac{y}{x}+1} = \log x + \log c}$$

GAMMA CAREER CLASSES

DOWNLOAD GAMMA CAREER CLASSES AAP!

Linear Differential Equations

$$\frac{dy}{dx} + Py = Q$$

Where p and q are Constant or Function of x only.

$$I.F \rightarrow e^{\int P dx}$$

$$y \times I.F = \int Q \times I.F \, dx + C$$

$$\frac{dx}{dy} + Px = Q$$

Where p and q are Constant or Function of y only.

$$I.F = e^{\int P dy}$$

$$x \times I.F = \int Q \times I.F \, dy + C$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

Write the integrating factor for each of the following differential equations

i) $x\log x\frac{dy}{dx}+y=2\log x$

$$\frac{dy}{dx}+Py=Q$$

$$\frac{dy}{dx}+\frac{y}{x\log x}=\frac{2}{x}$$

$$P=\frac{1}{x\log x} \qquad Q=\frac{2}{x}$$

$$I.F=e^{\int P\,dx}$$

$$=e^{\int \frac{1}{x\log x}\,dx}$$

$$=e^{\int \frac{\frac{1}{x}}{\log x}\,dx}$$

$$=e^{\log(\log x)}$$

$$I.F=\log x$$

$$\int \frac{\frac{1}{x}}{\log x}\,dx$$

$\log x = t$

$\frac{1}{x}dx = dt$

$\int \frac{1}{t}\,dt$

$\log t$

$\log(\log x)$

DOWNLOAD GAMMA CAREER CLASSES AAP!

ii) $(1+y^2)dx-(\tan^{-1}y-x)dy=0$

$(1+y^2)dx=(\tan^{-1}y-x)dy$

$(1+y^2)\frac{dx}{dy}=\tan^{-1}y-x$

$(1+y^2)\frac{dx}{dy}+x=\tan^{-1}y$

$\frac{dx}{dy}+\frac{x}{1+y^2}=\frac{\tan^{-1}y}{1+y^2}$

$P=\frac{1}{1+y^2}$ $\quad Q=\frac{\tan^{-1}y}{1+y^2}$

$I.F=e^{\int P\,dy}$

$=e^{\int\frac{1}{1+y^2}dy}$

$I.F=e^{\tan^{-1}y}$

DOWNLOAD GAMMA CAREER CLASSES AAP!

Solve the following differential equations

$$(x^2-1)\frac{dy}{dx}+2xy=\frac{2}{x^2-1}$$

$$\boxed{\frac{dy}{dx}+Py=Q}$$

$$\frac{dy}{dx}+\frac{2xy}{x^2-1}=\frac{2}{(x^2-1)^2}$$

$$P=\frac{2x}{x^2-1} \qquad Q=\frac{2}{(x^2-1)^2}$$

$$I.F=e^{\int P\,dx}=e^{\int \frac{2x}{x^2-1}dx}=e^{\log(x^2-1)}=x^2-1$$

$$y\times I.F=\int Q\times I.F\,dx+c$$

$$y\times(x^2-1)=\int\left(\frac{2}{(x^2-1)^2}\times x^2-1\right)dx$$

$$y(x^2-1)=\int\frac{2}{(x^2-1)}dx$$

$$y(x^2-1)=2\times\frac{1}{2\times1}\log\frac{(x-1)}{x+1}+c$$

$$\boxed{y(x^2-1)=\log\left(\frac{x-1}{x+1}\right)+c}$$

DOWNLOAD GAMMA CAREER CLASSES AAP!

Solve the following differential equations:-

$$\frac{dy}{dx} + 2y\tan x = \sin x$$

H.W

DOWNLOAD GAMMA CAREER CLASSES AAP!